

Designation:

Strisselspalt
Aramis
Triskel
Barbe-Rouge
Mistral
Elixir
... non-exhaustive list

Type 90 Pellets are a hop product added to the kettle to provide bitterness and a hop character that is indistinguishable from that achieved using raw hops. They can also be used post-fermentation for dry hopping. Pellets provide improved homogeneity, better storage stability and reduced storage/transport costs compared to raw hops. They produce a beer flavor which is not distinguishable from that produced from leaf hops. Supported by a long history of safe use in brewing, and in accordance with US FDA regulation 21 CFR 170.30(c) and 170.3(f), hop pellets are generally recognized as safe (GRAS).

Product Specifications:

Description: Cylindrical pellets of approx. 6 mm (0.24 inch) diameter, milled and compressed whole hops

Consistency: A solid which normally breaks up into a powder

Color: Typically, from dark-green to olive-green (depending on variety)

Alpha acids: As in raw hops, depending on variety and crop year

Beta acids: As in raw hops, depending on variety and crop year

Hop oils: As in raw hops, depending on variety and crop year

Moisture: 7 -12%

Process Specifications:

Drying temperature: $\leq 60^{\circ}\text{C}$ (140°F), depending on raw hop moisture content

Pelletizing temperature: $<55^{\circ}\text{C}$ (131°F)

Temperature of pellets after cooling: $< 20^{\circ}\text{C}$ (68°F)

Quality and Food Safety:

Comptoir-Agricole maintains quality management systems according to the ISO 9001 principles, as well as food safety management programs based on internationally recognized (HACCP) principles. Please refer to our web site (www.hops-comptoir.com) for more information on our systems and programs.

Product Use:

For efficient provision of bitterness, the pellets should be added to the wort at the beginning or up to 15 minutes after the start of the boil. Utilization of α -acids into beer depends on the boiling system and conditions and is normally in the range of 30%-35%. Added late into the boil, utilization of α -acids diminishes as the utilization of the aroma improves giving a characteristic hop flavor in the beer. The quantity to be added is calculated using the α -acids content and the estimated utilization. For aroma, the quantity to be added should preferably be calculated using the oil content of the product. Pellets can be dosed automatically.

Packaging:

Pellets are packed in laminated foils with an aluminum layer as a barrier against diffusion of oxygen. They are sealed under inert gas and/or vacuum packed. The foil material used meets all food industry packaging regulations. The residual oxygen content in the foil packs is less than 2% by volume. Pack sizes are available from 1 kg to 500 kg.

Storage and Best-by Recommendation:

Type 90 Pellets should be stored cool at 0-5°C (32-41°F). Pellets are best used within 3 years after processing. If stored at -20°C (-4°F), pellets should be used within 5 years. Foils, once opened, should be used within a few days to avoid deterioration of bitter acids and essential oils.

Analytical Methods:

The determination of α -acids comprises three types of methods, the specific measurement of α -acids by means of HPLC, spectrophotometric or conductometric methods:

α -acids can be measured by any of the following methods:

- EBC method 7.5 - (α -acids as lead conductometric value (LCV))
- ASBC Spectrophotometric method (Hops-6) - (α -acids and β -acids)
- By HPLC, using the current ICE standard, according to the EBC 7.7 method, or the ASBC method (Hops-14) - (α -acids and β -acids)

Hop oil concentration can be measured by:

- EBC 7.10
- ASBC Hops-13

Safety:

If dust is generated, it is advisable to use a dust mask. Hop pellets are a combustible material. For further information please consider the relevant Safety Data Sheet (SDS).

Technical Support:

We will be pleased to offer help and advice on the use of Hop Pellets in brewing.

Safety Data Sheet

Note

Hop pellets are not classified as dangerous products according to European Union legislation, and their use is as a food product in the brewing of beer. However, this safety data sheet is provided voluntarily according (as appropriate) to the principles of the Classification, Labelling and Packaging Regulations (Regulation (EC) No. 1272/2008).

1. Identification of the preparation and of the Company

- | | | |
|-----|---------------------|---|
| 1.1 | Product Identifier: | Hop Pellets (Type 90 Pellets) |
| | Synonyms: | PEL/PE 90, Kettle Pellets, Hop pellets |
| 1.2 | Relevant Uses | For use as an ingredient in the brewing of beer |
| 1.3 | Supplier: | Comptoir-Agricole.
35, route de Strasbourg
67270 HOCHFELDEN
France |

2. Hazards Identification

- 2.1 Classification: Not classified (Regulation (EC) No. 1272/2008)
Not classified (Directive 67/548/EEC)
- 2.2 Label Elements: N/A (not classified)
- 2.3 Other Hazards: Associated dust may be irritating to eyes, mouth and throat.

3. Components/Information on Ingredients

The product consists entirely of hop cones of the cultivated hop plant Humulus/Lupulus.
Many different varieties.

4. First Aid Measures

4.1 Description of Aid Methods:

- First Inhalation: Move to fresh air.
- Skin Contact: Brush off excess material and wash skin thoroughly with soap and water.
- Eye Contact: Flood the eye with plenty of water. If any symptoms persist obtain medical attention.
- Oral Ingestion: Drink large amounts of water to dilute. Vomiting may occur but should not be induced. Obtain medical attention if symptoms persist.

4.2 Most Important Symptoms and Effects: None known. See Section 2.3.

4.3 Indication of Immediate Medical Attention or Special Treatment: None known

5. Fire-fighting Measures

- 5.1 Extinguishing media: Carbon dioxide, dry powder and foam. Keep containers and surroundings cool with water spray. Great care should be taken using water/jet spray.
- 5.2 Special Hazards Arising from Substance: not known.
- 5.3 Advice for Firefighters: Fire-fighters should wear self-contained positive pressure breathing apparatus.

6. Accidental Release Measures

- 6.1 Personal Protection: Wear appropriate protective clothing-see Section 8.
- 6.2 Environmental Precautions: Do not discharge onto the ground or into watercourses.
- 6.3 Methods for Cleaning Up: normal clean-up procedures as for any agricultural commodities.

7. Handling and Storage.

- 7.1 Precautions for Safe Handling: Avoid generating excessive dust. Avoid excessive contact with product. Use appropriate protective clothing as indicated in Section 8. Wash hands after use.
- 7.2 Conditions for Safe Storage: To guarantee quality avoid heat, moisture and strong odors during storage. Pellets should not be exposed to temperatures above 20°C (68°F) since it is possible that gases are formed from hop constituents. The resulting pressure increase may cause

bursting of the foils. Consequently, the pellets will be exposed to air and oxidation resulting in a considerable deterioration of quality. Suitable storage containers are thick gauge laminated foil bags, stainless steel and lacquered mild steel

7.3 Specific End Uses: The substance is manufactured for use as a food ingredient and for such uses is not subject to registration via REACH (Regulation (EC) No. 1907/2006). It should be used in accordance with applicable food legislation.

8. Exposure controls / Personal protection

8.1 Control Parameters: Not applicable.

8.2 Exposure Controls: Engineering Controls: Provide adequate ventilation.
 Eye/Face Protection: If in danger of generating dust, wear goggles.
 Hand Protection: Gloves possible (not mandatory)
 Skin Protection: Gloves possible (not mandatory)
 Respiratory Protection: If in danger of generating dust, wear a facemask.

9. Physical and Chemical Properties

Appearance: pelleted powder. Various shades of green.

Odor:	No data available
Odor Threshold:	No data available
pH:	No data available
Melting Point:	No data available
Boiling Point:	No data available
Flash Point:	No data available
Evaporation Rate:	No data available
Flammability:	No data available
Upper/Lower Flammability:	No data available
Vapour Pressure:	No data available
Vapour Density:	No data available
Density:	450-700 kg.m-3
Solubility in water:	Insoluble
Partition coefficient:	No data available
Auto-ignition Temperature:	No data available
Decomposition Temperature:	No data available
Viscosity at 20°C:	No data available
Explosive properties:	No data available
Oxidising properties:	No data available

10. Stability and Reactivity

10.1 Reactivity: No reactivity hazards known

10.2 Chemical Stability: Stable if stored in accordance with 7.2

10.3 Possibility of Hazardous Reactions: None known

10.4 Conditions to Avoid: See Section 7.2

10.5 Incompatible Materials: None known

10.6 Hazardous Decomposition Products: None known

11. Toxicological Information

11.1 Acute Toxicity: Hops and hop extracts are generally recognized as safe (GRAS) for their intended use in accordance with US FDA regulation, 21 CFR 182.20. Supported by a long history of safe use in brewing.

11.2 Skin Corrosion/irritation: No data available

11.3 Serious Eye Damage/irritation: No data available

11.4 Respiratory or Skin Sensitization: No data available

11.5 Germ Cell Mutagenicity: No data available

11.6 Carcinogenicity: No data available

11.7 Reproductive Toxicity: No data available

11.8 STOT-single Exposure: No data available

11.9 STOT-Repeated Exposure: No data available

11.10 Aspiration Hazard: No data available

12. Ecological Information

12.1 Toxicity: No data available

12.2 Persistence and Degradability: No data available. All-natural product.

12.3 Bio accumulative Potential: No data available. All-natural product, not expected to bio accumulate.

12.4 Mobility in Soil: No data available

12.5 Results of PBT and vPvB Assessment: No data available

12.6 Other Adverse Effects: No data available

13. Disposal Considerations

Product disposal: Dispose in accordance with all applicable local and national regulations.

Container disposal: Labels should not be removed from containers until they have been cleaned. Contaminated containers should not be treated as household waste. Containers should be cleaned using appropriate methods and then re-used or disposed of by landfill or incineration as appropriate.

14. Transport information

UN-Number: Non-hazardous for transport

Class: Non-hazardous for transport

Shipping name: Hop Pellets (Type 90 Pellets)

Packing group: Non-hazardous for transport

Marine pollutant: No data available

15. Regulatory Information

15.1 Safety, Health and Environmental Regulations: No data available

15.2 Chemical Safety Assessment: No data available

16. Other Information

The information in this safety data sheet is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. The information in this document is based on our present knowledge and should be used only as a



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HOUBLONS

supplement to information already in your possession concerning this product. It does not represent any guarantee of the properties of the product. The determination of whether and under what condition the product should be used is yours to make. We do not accept any liability for loss, injury or damage that may result from its use.



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